

# Process Description

## SONIQTWIST



- Welding
- Beading
- Riveting
- Separating
- Size and shape calibration of functional surfaces
- Fine forming

ultrasonic

# Process Description

## SONIQTWIST

The new welding process can be classified between vibration welding and ultrasonic welding. A generator sets a frequency of 20 KHz and is connected to the converter via an HF cable that is positioned at a right angle to the booster sonotrode combination.

Up to four converters can be used with one sonotrode, thus providing a maximum output of 12 kW.

The sonotrode takes up the torsional excitation via the booster and operates in a frequency of 20 kHz reversing with an amplitude of approx. 40 µm. The high frequency enables a very high energy input in the shortest possible time (generally < 1 sec).

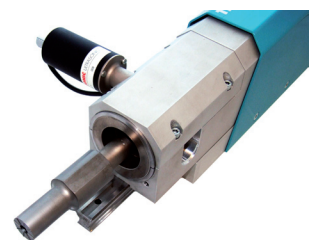
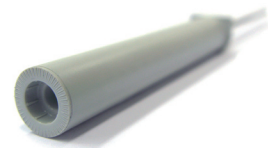
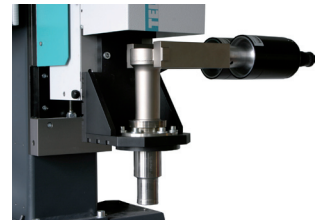
Once the ultrasound is switched off, the sonotrode immediately returns to its initial setting. There is no component offset.

The process does not require external heat input. The Sonotrode contacts the upper one of the components to be welded.

This movement and the welding pressure produce an interface and molecular friction between the partner joints that plasticizes the plastic in the weld zone via the melting temperature.

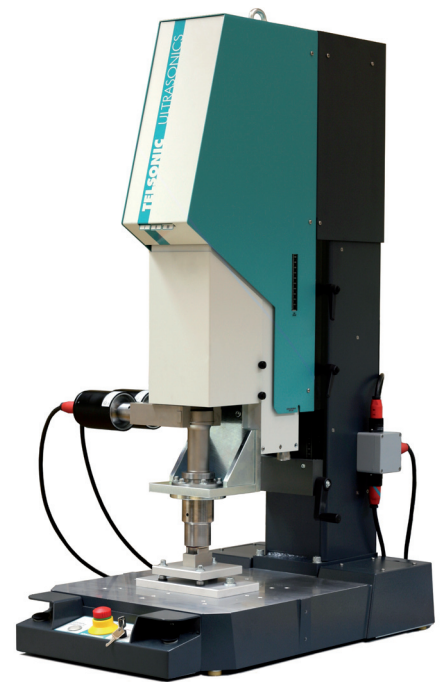
There are three different process phases.

- I : Pure solid friction
- II : Partial start of plastification.
- III : Stationary fluid formation takes place.



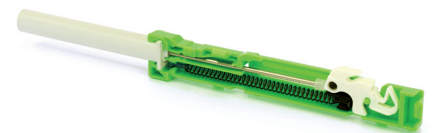
## Advantages of **SONIQTWIST**

- Minimal vibration in the lower part, approx. 1:10 (sensitive parts, electronic)
- Very short cycle times < 1 second
- Cost effective process
- Good accessibility as only one vertical movement is required
- Very high weld strength
- Excellent process control
- Far zone welds in centimetre range
- No membrane effect with film and thin components
- High cutting depth potential
- The parts do not have to be round, square execution presents no problems
- Output up to 12,000 Watt
- Duroplast connections are possible
- Foreign bodies in the welding seam do not impair process



## SONIQTWIST Application Solutions

- PA, round housing, with internal electronic tight weld, e.g. sensors
- PA, square housing, with internal electronic tight weld, e.g. sensors
- PP, inflated part with uneven surface, weld on foil –medical component
- PP/EPDM, weld in bumper distance sensor holder – high strength, no impressions visible on the painted side. Also weld on previously painted components!
- ABS, tight weld bumpers, through the oil medium
- PP, inscription devices, cosmetics industry, tight welding
- PP, holders on automotive interiors
- PA, fixing components on Duroplast honeycomb plate
- PA6.6GF30, High pressure container 80mm diameter
- PC/ABS, automotive loudspeaker a ring weld to replace numerous rivets.
- MIM, intricate work on valve seats
- PE, foil valves
- calibration of injection moulded components



## Join Partners

All thermoplastics (including PA,PP,PPA,PP/EPDM,POM,PE)

Soft materials must have the required rigidity to be processed by the sonotrode.

Fibre-strengthened thermoset plastics can be used as a join partner. Welding of a thermoplastic and another jointing component creates a high strength polymer bond.

**ALPHA**

Alpha bvba  
Kleimoer 2, 9030 Gent, Belgium  
Tel. +32 9 243 80 90, Fax. +32 9 243 80 91  
Info@alpha.be, www.alpha.be

PLASTIC